

NON-PUBLIC?: N
ACCESSION #: 9008020151
LICENSEE EVENT REPORT (LER)

FACILITY NAME: VOGTLE ELECTRIC GENERATING PLANT - UNIT 2 PAGE: 1
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DOCKET NUMBER: 05000425

TITLE: MANUAL REACTOR TRIP FOLLOWING MSIV CLOSURE DUE TO O-
RING FAILURE

EVENT DATE: 06/28/90 LER #: 90-008-00 REPORT DATE: 07/27/90

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 87

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION:
50.73(A)(2)(IV)

LICENSEE CONTACT FOR THIS LER:

NAME: R. M. ODOM, NUCLEAR SAFETY AND TELEPHONE: (404) 826-3201
COMPLIANCE

COMPONENT FAILURE DESCRIPTION:

CAUSE: B SYSTEM: SB COMPONENT: ISV MANUFACTURER: R344
REPORTABLE NPRDS: Y

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT:

On 6-28-90, indication was received in the control room that Main Steam Isolation Valve (MSIV) 2HV-3026A was closing. Operators who were dispatched to investigate found hydraulic fluid spraying from the valve. After an unsuccessful attempt to keep the valve open, a manual reactor trip was initiated at 1906 CDT due to decreasing level in Steam Generator No. 3. A feedwater isolation and an auxiliary feedwater actuation occurred per design. By 1947 CDT, the unit had been stabilized in Mode 3 without incident.

The cause for the MSIV closure was the failure of an o-ring which seals the connection of the "non-pump side" manifold assembly to a boss on the actuator cylinder. Factors which could have contributed to the o-ring failure included a slight misalignment of the cylinder boss and manifold

assembly, a small low spot at the edge of the actuator cylinder boss, and evidence that the o-ring may have been pinched on installation. As a temporary modification, a spacer and a smaller diameter o-ring have been installed to ensure the o-ring seating surface is not too close to the outside diameter of the boss. The proposed permanent modification is to machine the boss to provide a better seating surface.

END OF ABSTRACT

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A. REQUIREMENT FOR REPORT

This report is required per 10 CFR 50.73(a)(2)(iv) because an unplanned manual actuation of the Reactor Protection System occurred.

B. UNIT STATUS AT TIME OF EVENT

At the time of this event, Unit 2 was operating in Mode 1 (Power Operation) at 87% of rated thermal power. Other than that described herein, there was no inoperable equipment which contributed to the occurrence of this event. While it did not contribute to the occurrence of this event, Main Steam Isolation Valve (MSIV) 2HV-3026B was manually blocked open for maintenance.

C. DESCRIPTION OF EVENT

On 6-28-90, at 1901 CDT, a trouble annunciator was received in the Unit 2 Control Room for the Loop 3 Train A MSIV, 2HV-3026A. The Support Shift Supervisor (SSS) and a Plant Equipment Operator (PEO) were immediately dispatched to investigate. At 1903 CDT, a gas low pressure annunciator was also received for 2HV-3026A. Additionally, the Balance-of-Plant (BOP) operator observed dual indication on the control board for 2HV-3026A, indicating that the valve was closing. In an attempt to keep the valve open, the BOP operator took manual control of the handswitch and held it in the "open" position. Upon arrival at 2HV-3026A, the SSS and the PEO found a large quantity of hydraulic fluid spraying from the valve. While the PEO was reporting this discovery back to the Control Room, the Shift Superintendent arrived and directed the hydraulic block valves to be closed. This action was accomplished but did not stop the hydraulic fluid leak or the MSIV from drifting shut. At 1906 CDT, with Steam Generator No. 3 level at 30% and lowering, steam pressure increasing, and steam flow lowering on loop 3, the Unit 2 reactor was manually tripped.

On the reactor trip, all control rods fully inserted. The Main Feedwater System isolated, and the Auxiliary Feedwater (AFW) System actuated as designed. After completing the immediate operator verifications required by emergency operating procedure 19000-C, "E-O Reactor Trip or Safety Injection," emergency operating procedure 19001-C, "ES-0.1 Reactor Trip Response," was entered at 1910 CDT. By 1947 CDT, the unit had been stabilized in Mode 3 (Hot Standby) and unit operating procedure 12006-C, "Unit Cooldown to Cold Shutdown," was entered. At 2031 CDT, the associated bypass valves for 2HV-3026A and 2HV-3026B were closed to comply with Technical Specification action requirements.

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Equipment malfunctions observed following the reactor trip included a failure of the +22 VDC power supply for the Turbine EHC system. Also, a subsequent review of reactor trip data indicated that the Atmospheric Relief Valves (ARV's) for Steam Generator Loops 1 and 2 opened momentarily at a pressure below their setpoint. These equipment malfunctions had no impact on the ability to safely shut down the reactor or to achieve stable plant conditions.

D. CAUSE OF EVENT

The direct cause of the event was closure of the MSIV which resulted in increased steam header pressure and a corresponding shrink in Steam Generator No. 3 level. The cause for the MSIV closure was a loss of hydraulic fluid pressure which occurred due to an o-ring failure. The o-ring which failed is located within the counterbore depth of a flange connection between the MSIV "non-pump side" manifold assembly and a boss on the actuator cylinder body. The root cause for the o-ring failure could not be definitely determined; however, two factors were identified which could have contributed to the failure. For 2HV-3026A, a slight misalignment was discovered to exist between the cylinder boss and the actuator assembly. This resulted in the o-ring seating surface being very close to the outer edge of the boss. In addition, a small low spot was discovered at the outer edge of the cylinder boss. A second factor was that the failed o-ring showed evidence of possibly being pinched on installation. (Note: The o-ring was installed by the valve vendor approximately two years prior to the failure.)

The cause for the failure of the +22 VDC power supply was determined to be that the power supply voltage had drifted out of adjustment. No cause could be determined for the momentary opening of the ARV's.

E. ANALYSIS OF EVENT

Control Room operators responded appropriately to initiate a manual reactor trip, thus precluding a challenge to an automatic trip setpoint. The fail-safe position for a MSIV is the closed position.

Accident analyses indicate that the AFW system and the main steam line safety relief valves are capable of adequately removing the stored heat of the primary water system during emergency conditions without relying on the normal feedwater system or steam dump to the main condenser. Following the reactor trip, the AFW system functioned properly to supply water to the steam generators. A challenge to the main steam line safeties did not occur, since steam dump to the condenser remained available via main steam lines 1, 2, and 4. The opening of the two ARV's was a momentary occurrence and therefore did not result in an excess cooldown rate. Based on these considerations, there was no adverse effect on plant safety or on the health and safety of the public.

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F. CORRECTIVE ACTIONS

1. As a temporary modification for 2HV-3026A, a spacer and a smaller diameter o-ring were installed in place of the failed o-ring. The proposed permanent modification involves machining the boss to provide a better seating surface for the o-ring. A permanent modification will be implemented during the refueling outage scheduled for September, 1990.
2. The manifold assembly mounting bolts for all Unit 2 MSIV's were checked and were found to be torqued to the specified value.
3. The +22 VDC power supply voltage has been readjusted.
4. The control loops for the two ARV's were checked and the ARV's were determined to be opening within the allowable setpoint range.

G. ADDITIONAL INFORMATION

1. Failed Components Identification

MSIV - Edwards Valve Company (formerly a division of Rockwell International) 28" x 24" x 28" Equiwedge Gate Valve with an

A-290 Actuator.

O-Ring - Commercial EPR (Propylene), Rockwell Part No. 2-223.

2. Previous Similar Events

LER 50-425/1990-007 described a VEGP Unit 2 reactor trip which occurred on 5-6-90 due to closure of MSIV 2HV-3026A. However, the root cause of that event was different since the MSIV closure occurred due to a relay failure.

3. Energy Industry Identification System Codes

Main/Reheat Steam System - SB

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July 27, 1990
the southern electric system
W. G. Hairston, III
Senior Vice President
Nuclear Operations

ELV-01951
511

Docket No. 50-425

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

Gentlemen:

VOGTLE ELECTRIC GENERATING PLANT

LICENSEE EVENT REPORT
MANUAL REACTOR TRIP FOLLOWING MSIV CLOSURE
DUE TO O-RING FAILURE

In accordance with 10 CFR 50.73, Georgia Power Company hereby submits the enclosed report related to an event which occurred on June 28, 1990.

Sincerely,

W. G. Hairston, III

WGH,III/NJS/gm

Enclosure: LER 50-425/1990-008

xc: Georgia Power Company
Mr. C. K. McCoy
Mr. G. Bockhold, Jr.
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*** END OF DOCUMENT ***
